THE USE OF THE ISO 14001 STANDARD IN A WATER CONSERVATION PROGRAM

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Abstract. The ISO 14001 standard that was approved as an international standard in the fall of 1996 establishes a protocol for the implementation of an environmental management system (EMS) at a facility. An EMS is a systematic approach for establishing and achieving environmental goals. This paper will describe an EMS specifically designed to conserve the use of process water at an industrial facility. The paper will following the requirements of the ISO 14001 standard in that environmental policy, aspects, significant impacts, objectives, and targets will be described. The paper will also address systems for monitoring, corrective action, and management review as required by the standard.

INTRODUCTION

The EMS defined by the ISO 14001 standard is essentially a modified Demming cycle. It follows the concept of plan, do, check and act (PDCA). The first activity is planning the overall goals of the system as well as the various activities that will be undertaken to accomplish these goals. The "do" activity is where the system planned is actually put into place and operated. "Check" are those activities that evaluate the operation of the system to determine if the objectives and targets established during the planning activity are being met. Finally, the "act" function is where the system is reviewed, progress toward objectives evaluated, and changes made to the system where required. The repetition of this PDCA cycle is the basis for the continual improvement process required by the ISO 14001 EMS standard.

OVERVIEW OF THE STANDARD

This PDCA concept is detailed in section 4 of the ISO 14001 standard. The parts of Section 4 are listed in Table 1.

Section 4.1 is a general requirement to implement an EMS. The planning activity is covered in sections 4.2 and 4.3 of the standard. Section 4.2 requires the development of an environmental policy which provides the overall guidance for the EMS. Section 4.3 requires the identification of the environmental aspects of the facility, the evaluation of the aspects to determine those that are significant, and the establishment of objectives and targets related to these significant impacts. The last requirement of section 4.3 is to determine the details of the EMS that will be implemented to meet these objectives and targets.

Table 1. ISO 14001 Section 4 Parts

Part	Title
4.1	General Requirements
4.2	Environmental Policy
4.3	Planning
4.4	Implementation and Operation
4.5	Checking and Corrective Action
4.6	Management Review

Section 4.4 defines the requirements for the "do" activity or the actual implementation. These activities include defining authorities and responsibilities and allocating resources for the EMS, training the staff to implement the system, communicating the system to both internal and external resources, developing documentation including manuals and procedures to implement the system and controlling this documentation, and actually operating the system. A final requirement of this section of the standard is emergency preparedness and response procedures for the elimination and/or minimization of environmental problems.

Section 4.4 has two requirements that closely parallel the ISO 9000 quality system standard. The first is the appointment of a management representative who has both the overall responsibility and authority for the implementation of the EMS. The second is the document control requirement which can be a significant undertaking for companies not familiar with the system.

Section 4.5 defines the requirements for the checking activities of the system. These activities include monitoring and measurement of system performance, a method of evaluating non conformance and both corrective and preventive action, methods for maintaining and controlling records of system performance, and finally a method of auditing the system. These function are very similar to the requirements of ISO 9000.

Finally, section 4.6 defines the requirements of the "act" function of the standard. All of the results of the checking activities such as monitoring and measurement, corrective action, corrective and preventive action, internal audits, and other EMS activities are reviewed by management. This process determines if the EMS is meeting objectives and targets as well as determining how the system should be modified for continual improvement.

CONFORMANCE VERSUS COMPLIANCE

One of the key issues related to ISO 14001 is that of conformance versus compliance. An audit of an EMS determines if the system conforms to the ISO 14001 standard. Since the standard requires only a commitment to compliance with the regulations, an EMS audit will only seek to determine if there is evidence of this commitment. Therefore, an EMS audit does not confirm that an industry is complying with the regulations.

This conformance versus compliance issue is one of the reasons why the U.S. Environmental Protection Agency (USEPA) and state regulatory agencies are not making any commitments to the ISO 14000 standard at this time. Their mandate is enforcement of the regulations. The implementation of an EMS with a commitment to compliance should increase the probability that an industry will be in compliance but, since the implementation of the standard does not guarantee compliance but, the regulatory agencies are taking a wait and see attitude.

Water conservation is a different situation. This is usually not a regulatory issue except for restrictions on the amount of water that the city will provide or that can be withdrawn from an aquifer. Therefore an EMS conforming to the requirements of ISO 14001 would be appropriate to this situation.

ENVIRONMENTAL POLICY

The environmental policy should specifically address the water conservation program. A statement similar to the following might be appropriate: "It is our policy to conserve all natural resources and specifically the use of water in our processes through an environmental management system that will be continually improved to meet reduction targets." A statement similar to this specifically addresses the water conservation program and satisfies the ISO 14001 requirement that the policy has a commitment to continual improvement. The policy should address other environmental issues, particularly if the company plans to seek registration.

ENVIRONMENTAL ASPECTS AND SIGNIFICANT IMPACTS

An EMS that has water conservation as key element should identify this activity as one of the EMS aspects and an aspect with a significant impact. As previously discussed, the standard does not give a formula for identification of aspects and significant impacts, but only requires that a procedure be put in place to identify these entities. A facility seeking registration will likely have other aspects and significant impacts identified.

The selection of aspects related to water conservation can be based on several factors. Some companies may have somewhat altruistic goals such as sustainable development or the Natural Step. Another company may approach the development of aspects from a business standpoint such as the concern over the prevention of the growth of the company due to water withdrawal restrictions by the state. Any of these methodologies conform to the standard.

OBJECTIVES AND TARGETS

The objectives and targets for the EMS are based on the significant impacts defined for the facility. Since water conservation has been identified as an aspect with a significant impact for the facility, objectives and targets would be set for this activity. The definition of objectives and targets in the ISO 14001 standard requires that these be quantified where practicable. One suggestion would be to set an objective such as a 50 percent reduction in water usage per unit of production over the next five years, with a target of a 20 percent reduction during the first year.

Another objective could involve the evaluation of new technology for water conservation. It is possible that the EMS planning team needs additional data on prospective new technologies before making a decision for purchase. Therefore, an objective could be to evaluate new technologies for water reduction with a target of completing the evaluation of the top three candidates during the first year.

The setting of targets always involves the issue of setting too lofty a target as opposed to setting a target that can reasonable be achieved. Some would argue that the lofty targets keeps the company focused on the long range goal while others propose that, unless individuals achieve some goals, they tend to lose interest in the program. The authors propose that achievable targets are the best recommendation since they do give the company a sense of accomplishment. The EMS requires continual improvement, and so the target for the next year can be to take another achievable step in reaching the lofty goal.

MONITORING AND MEASUREMENT

The monitoring and measurement that is required by the standard should be specifically geared toward water usage. The EMS should be designed such that data from this activity are collected frequently, analyzed, and changes made to the operation of the EMS to keep the company on track to meeting the targets for the year.

CORRECTIVE AND PREVENTIVE ACTION

The corrective action program required by the standard could be initiated by several activities. Problems identified by the monitoring and measurement program could result in the generation of a corrective action to investigate and recommend changes to keep the system focused on achieving the target for the year. The internal audits program discussed in a following section could result in a corrective action to keep the EMS conforming to the system.

Preventive action could be initiated on a review of the corrective action activity. Repetitions of the same corrective action could indicate a systemic problem that requires some preventive action to stop future re-occurrence. Line workers are often an excellent source of information on techniques to prevent future problems. A method for these individuals to tie into the preventive action program should be established.

INTERNAL AUDITS

The registrar interpretation of standard requires that internal audits of all parts of the EMS be conducted a minimum of once per year. If water conservation is the cornerstone of the EMS, it is recommended that activities related to this aspect be conducted on a more frequent schedule.

MANAGEMENT REVIEW

While on-going evaluation of the EMS is recommended as a part of the system operation and the monitoring and measurement activity, the management review is where the progress in achieving the water conservation targets is evaluated, new targets are established, and formal changes are made to the policy, aspects, and other parts of the EMS. Top management must be actively involved in this meeting and other activities of the system.

SUMMARY

The Environmental Management System (EMS) as specified by the ISO 14001 standard can provide a structured framework for a water conservation program. This framework contained in the standard can be used even if the company does not seek registration of its system. However, as is the case with any system, an EMS must have the support of top management to include resources if the program is to be successful.